

## LISTING OF THE CLAIMS

**This listing of claims will replace all prior versions, and listings, of claims in the application:**

1. (currently amended) An electromagnetic field stimulator device for Anatomic Biophysical Chondroprotection, comprising:

~~in which~~ means of current generation ~~are suitable~~ for powering at least one solenoid to generate an electromagnetic field directed on a part of the human body including cartilaginous tissue,

~~wherein~~ characterized ~~in that~~ the said means of current generation supplies said solenoid with current (i(t)) having a waveform that includes the repetition of a linear ramp with a certain slope; said current (i(t)) causing the generation of an electromagnetic field that induces on a control probe irradiated by said electromagnetic field, a voltage (V<sub>in</sub>) of markedly constant amplitude during the ramp-like linear growth period of said current (i(t)).

2. (currently amended) A device according to claim 1, ~~wherein~~ ~~in which~~ said means of current generation include ~~includes~~ at least one table in which at least one function (f(t)) is stored that provides, for each value of a scanning signal in input (sc), an output value that expresses a target current intensity (I<sub>out</sub>), the said function f(t) being a linear one and representing a ramp with a certain slope that supplies, for increasing values of said scanning signal in input (sc), linearly increasing values of said target current intensity (I<sub>out</sub>).

3. (currently amended) A device according to claim 2, wherein ~~in which~~ said table includes a plurality ~~contains a number~~ of functions (f(t)) of different, selectable types.

4. (currently amended) A device according to claim 2, further comprising ~~in which~~ timer devices ~~are provided that are~~ suitable for generating said scanning signal in input (sc).

5. (currently amended) A device according to claim 2, further comprising ~~in which~~ attenuator devices having ~~are provided with~~ their input communicating with the output of said

table, said attenuator devices being suitable for reducing the value of said target current intensity (Iout) in function of a programmable parameter (IPK) to limit the maximum value of said current (i(t)) feeding said solenoid.

6. (currently amended) A device according to claim 1, ~~further comprising in which~~ a feedback system ~~for is provided that performs~~ continuous monitoring of said current (i(t)) present in said solenoid, and comparing a measured current value (Imis) with a reference value (Iout);

wherein in cases of variances between ~~the two~~ said measured current and reference values, due to changes in impedance of said solenoid, said feedback system automatically ~~takes care of adjusting~~ adjusts the value of said current (i(t)) feeding said solenoid in order to maintain the waveform of said induced voltage (Vin) unaltered.

7. (currently amended) A device according to claim 6, ~~wherein in which~~ said feedback system includes:

detector devices suitable for supplying said measured current value (Imis), and

subtraction devices suitable for generating an error signal in function of said measured current value (Imis) and of said reference value (Iout).

8. (currently amended) A device according to claim 7, ~~wherein in which~~ a generator circuit is provided that receives said error signal in input and generates an alternating analogue power signal (S(t)) having a fixed frequency and variable duty cycle in function of said error signal, said variable duty cycle being suitable for regulating the intensity of said current (i(t)).

9. (currently amended) A device according to claim 8, ~~wherein in which~~ said generator circuit includes a pulse width modulator.

10. (currently amended) A device according to claim 8, ~~further comprising in which~~ low-pass filter devices ~~are provided~~ between the output of said generator circuit and the said solenoid.

11. (currently amended) A device according to claim 1, ~~wherein in which~~ said solenoid is made from a plurality number of sheets of a flexible material to ~~be adapted~~ adapt itself to the shape of said portion of the human body.

12. (currently amended) A method for Anatomic Biophysical Chondroprotection, comprising the steps phases of:

generating an electromagnetic field; and

applying ~~[[it]]~~ the electromagnetic field to a portion of the human body including cartilaginous tissue, ~~wherein said step characterized by the fact that said phase of generating an electromagnetic field includes the phase step of:~~

powering a solenoid with current  $(i(t))$  having a waveform that includes the repetition of a ramp with a certain slope, said current  $(i(t))$  causing the generation of an electromagnetic field that induces on a control probe irradiated by said electromagnetic field, a voltage  $(V_{in})$  of markedly constant amplitude during the period of ramp-like linear growth of said current  $(i(t))$ .

13. (currently amended) A method according to claim 12, ~~wherein in which~~ said current  $(i(t))$  presents an intensity and said solenoid presents a configuration such that said electromagnetic field penetrates in depth into said portion of the human body until it permeates said portion of cartilage and a portion of subchondral bone associated with said portion of cartilage over their entire thickness and in their entire extension, to activate ~~at least one of the following processes~~ at intracellular level a process selected from at least one of:

a process of articular inflammation control regarding both subchondral bone and the articular structures,

a process of articular inflammation control capable of acting in a specific manner on the adenosine receptors A2A of the cell membrane of pro-inflammatory cells, neutrophils, doubling the number of bonds with adenosine,

a process of inhibiting the catabolic effect of inflammatory cytokines acting directly on the chondrocyte and on the cartilaginous matrix,

a process of increasing the metabolic activity of chondrocytes and the synthesis of proteoglycans,

a process of inhibiting degeneration of articular cartilage, preserving the integrity of the same articular cartilage,

a process of rapid healing of subchondral bone tissue,

a process of healing bone marrow edema regarding the subchondral bone of femoral condyles, and

a process of healing and integration of bone grafts after ligament reconstruction operations on the fibrous flexor sheaths of the knee.

14. (currently amended) A method according to claim 12, ~~wherein in which~~ said current presents an intensity and said solenoid presents a configuration such that said electromagnetic field penetrates in depth into said portion of the human body until it permeates said portion of cartilage and a portion of subchondral bone associated with said portion of cartilage over their entire thickness and in their entire extension, to activate, in the presence of an osteo-cartilaginous graft, a preservation process for the viability of said portion of cartilage and trigger an effect selected from at least one of ~~the following effects~~:

inhibition of reabsorption phenomena on the underlying bone,

rapid anchorage of graft,

good osteointegration of graft, and

inhibition of the formation of bone cysts.

15. (currently amended) A method according to claim 12, ~~wherein in which~~ said solenoid is made from a plurality number of sheets of a flexible material to be adapted ~~adapt itself~~ to the shape of said portion of the human body.